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Serial No.: 08/479,997
Filed: June 7, 1995
Page 2 (Amendment Under 37 C.F.R. § 1.116 – November 20, 1998)

PREVIOUSLY PENDING CLAIMS 454-575
EXHIBIT 3 TO DECLARATION OF DR. CHERYL H. AGRIS,
ATTORNEY AT LAW (IN SUPPORT OF THE WRITTEN
DESCRIPTION, ENABLEMENT & NON-OBVIOUSNESS OF
THE INVENTION CLAIMED IN U.S. PATENT APPLICATION
SERIAL NO. 08/479,997

AMEND THE ABOVE-IDENTIFIED APPLICATION AS FOLLOWS:

In The Specification:

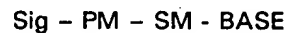
Page 53, line 22, after "ribonucleotide. The" and before "vicinal"
change "3', 4'" to -- 3', 2' -- .

In The Claims:

Cancel claims 310-372 and 405-453.

Add new claims 454-573 as follows:

-- 454. (NEW) An oligo- or polydeoxyribonucleotide comprising at least one nucleotide having the formula

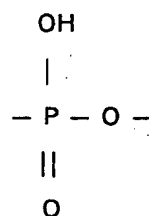


wherein PM is a phosphate moiety, SM is a sugar moiety and BASE is a moiety selected from the group consisting of a pyrimidine, a purine and a deazapurine, or analog thereof, said PM being attached to SM, said BASE being attached to SM, and Sig being covalently attached to PM directly or via a chemical linkage, said Sig being a moiety capable of non-radioactive detection when attached to PM or when said nucleotide is incorporated into said oligo- or polydeoxyribonucleotide. --

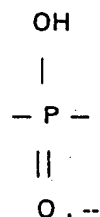
-- 455. (NEW) The oligo- or polydeoxyribonucleotide of claim 454, wherein said Sig is or renders the nucleotide self-signaling or self-indicating or self-detecting. --

-- 456. (NEW) The oligo- or polydeoxyribonucleotide of claim 454, wherein said Sig moiety comprises at least three carbon atoms. --

-- 457. (NEW) The oligo- or polydeoxyribonucleotide of claim 454, wherein said covalent attachment is selected from the group consisting of



and

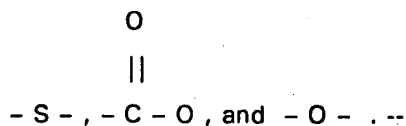
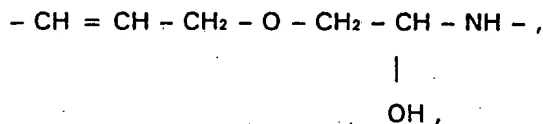
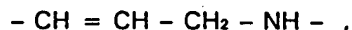
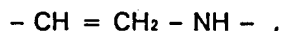


-- 458. (NEW) The oligo- or polydeoxyribonucleotide of claim 454, wherein said chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal. --

-- 459. (NEW) The oligo- or polydeoxyribonucleotide of claim 454, wherein said chemical linkage comprises a member selected from the group consisting of an olefinic bond at the alpha-position relative to the point of attachment to the nucleotide, a $-\text{CH}_2\text{NH}-$ moiety, or both. --

-- 460. (NEW) The oligo- or polydeoxyribonucleotide of claim 454, wherein said chemical linkage comprises an allylamine group. --

-- 461. (NEW) The oligo- or polydeoxyribonucleotide of claim 454, wherein said chemical linkage comprises or includes an olefinic bond at the delta-position relative to the point of attachment to the nucleotide, or any of the moieties:



-- 462. (NEW) The oligo- or polydeoxyribonucleotide of claim 454, wherein said chemical linkage of Sig includes a glycosidic linkage moiety. --

^{AMENDED}
463. (Re-written) The oligo- or polydeoxyribonucleotide of claim 454, wherein said PM is a monophosphate, a diphosphate or a triphosphate and said Sig moiety is covalently attached to said PM through a phosphorus atom or a phosphate oxygen.

-- 464. (NEW) The oligo- or polydeoxyribonucleotide of claim 454, wherein Sig comprises a component selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, an enzyme or an enzyme component, a hormone or a hormone component, a metal-containing component, a fluorescent component, a chemiluminescent component, an antigen, a hapten and an antibody or an antibody component, or a combination of any of the foregoing. --

-- 465. (NEW) The oligo- or polydeoxyribonucleotide of claim 464, wherein said electron dense component comprises ferritin. --

-- 466. (NEW) The oligo- or polydeoxyribonucleotide of claim 454, wherein Sig is complexed with a binding protein therefor, and said binding protein is conjugated to ferritin. --

-- 467. (NEW) The oligo- or polydeoxyribonucleotide of claim 464, wherein said magnetic component comprises magnetic oxide. --

-- 468. (NEW) The oligo- or polydeoxyribonucleotide of claim 467, wherein said magnetic oxide comprises ferric oxide. --

-- 469. (NEW) The oligo- or polydeoxyribonucleotide of claim 464, wherein said enzyme or enzyme component is selected from the group consisting of alkaline phosphatase, acid phosphatase, β -galactosidase, ribonuclease, glucose oxidase and peroxidase. --

-- 470. (NEW) The oligo- or polydeoxyribonucleotide of claim 464, wherein said metal-containing component is catalytic. --

-- 471. (NEW) The oligo- or polydeoxyribonucleotide of claim 464, wherein said fluorescent component comprises a member selected from the group consisting of fluorescein, rhodamine and dansyl. --

-- 472. (NEW) The oligo- or polydeoxyribonucleotide of claim 464, wherein Sig is selected from the group consisting of an antigen or hapten capable of complexing with an antibody or antibody component specific thereto, and an antibody or antibody component capable of complexing with an antigen or hapten. --

-- 473. (NEW) The oligo- or polydeoxyribonucleotide of claim 454, wherein said oligo- or polydeoxyribonucleotide is terminally ligated or attached to a polypeptide. --

-- 474. (NEW) A composition comprising the oligo- or polydeoxyribonucleotide of claim 454, a polypeptide capable of forming a complex with Sig and a moiety which can be detected when such complex is formed. --

-- 475. (NEW) The composition of claim 474, wherein said polypeptide comprises polylysine. --

-- 476. (NEW) The composition of claim 474, wherein said polypeptide is selected from the group consisting of avidin, streptavidin and anti-Sig immunoglobulin. --

--477. (NEW) The composition of claim 474, wherein Sig is a ligand and said polypeptide is an antibody thereto. --

-- 478. (NEW) The oligo- or polydeoxyribonucleotide of claim 454, wherein said Sig moiety is attached to a terminal nucleotide in said oligo- or polydeoxyribonucleotide. --

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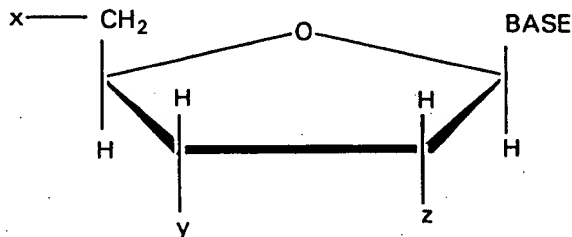
479. (~~Re-written~~) The oligo- or polydeoxyribonucleotide of claim 478, wherein the sugar moiety of said terminal nucleotide has a hydrogen atom at the 2' position thereof.

AMENDED

480. (~~Re-written~~) The oligo- or polydeoxyribonucleotide of claim 478, wherein the sugar moiety of said terminal nucleotide has hydrogen atoms at each of the 2' and 3' positions thereof.

-- 481. (NEW) The oligo- or polydeoxyribonucleotide of claim 454, comprising at least one ribonucleotide. --

-- 482. (NEW) An oligo- or polydeoxynucleotide comprising at least one nucleotide having the structural formula:



wherein BASE is a moiety selected from the group consisting of a pyrimidine, a purine and a deazapurine, or analog thereof, and wherein BASE is attached to the 1' position of the pentose ring from the N1 position when BASE is a pyrimidine or from the N9 position when BASE is a purine or a deazapurine;

wherein x is selected from the group consisting of H-, HO-, a mono-phosphate, a di-phosphate and a tri-phosphate;

wherein y is selected from the group consisting of H-, HO-, a mono-phosphate, a di-phosphate and a tri-phosphate;

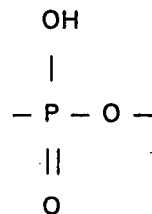
wherein z is H-; and

wherein Sig is covalently attached to x, y or z directly or through a chemical linkage, said Sig being a moiety capable of non-radioactive detection when so attached to x, y or z. --

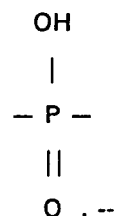
-- 483. (NEW) The oligo- or polydeoxynucleotide of claim 482, wherein said Sig is or renders the nucleotide or the oligo- or polynucleotide self-signaling or self-indicating or self-detecting. --

-- 484. (NEW) The oligo- or polydeoxynucleotide of claim 482, wherein said Sig moiety comprises at least three carbon atoms. --

-- 485. (NEW) The oligo- or polydeoxyribonucleotide of claim 482, wherein said covalent attachment is selected from the group consisting of



and

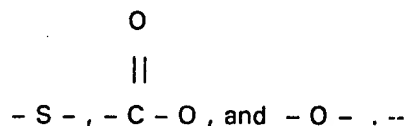
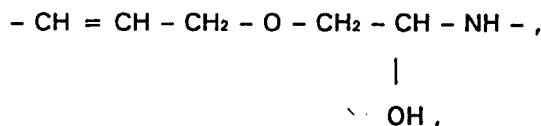
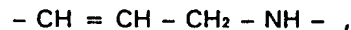


-- 486. (NEW) The oligo- or polydeoxyribonucleotide of claim 482, wherein said chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal. --

-- 487. (NEW) The oligo- or polydeoxyribonucleotide of claim 482, wherein said chemical linkage comprises a member selected from the group consisting of an olefinic bond at the alpha-position relative to the point of attachment to the nucleotide, a $-\text{CH}_2\text{NH}-$ moiety, or both. --

-- 488. (NEW) The oligo- or polydeoxyribonucleotide of claim 482, wherein said chemical linkage comprises an allylamine group. --

-- 489. (NEW) The oligo- or polydeoxyribonucleotide of claim 482, wherein said chemical linkage comprises or includes an olefinic bond at the delta-position relative to x, y or z, or any of the moieties:



-- 490. (NEW) The oligo- or polydeoxyribonucleotide of claim 482, wherein said chemical linkage of Sig includes a glycosidic linkage moiety. --

^{AMENDED}
491. (~~REMOVED~~) The oligo- or polydeoxyribonucleotide of claim 482, wherein said x and y each comprise a member selected from the group consisting of a monophosphate, a diphosphate and a triphosphate and said Sig moiety is covalently attached to either or both of said x and y through a phosphorus atom or a phosphate oxygen.

-- 492. (NEW) The oligo- or polydeoxyribonucleotide of claim 482, wherein Sig comprises a component selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, an enzyme or an enzyme component, a hormone or a hormone component, a metal-containing component, a fluorescent component, a chemiluminescent component, an antigen, a hapten and an antibody or an antibody component, or a combination of any of the foregoing. --

-- 493. (NEW) The oligo- or polydeoxyribonucleotide of claim 492, wherein said electron dense component comprises ferritin. --

-- 494. (NEW) The oligo- or polydeoxyribonucleotide of claim 482, wherein Sig is complexed with a binding protein therefor, and said binding protein is conjugated to ferritin. --

-- 495. (NEW) The oligo- or polydeoxyribonucleotide of claim 492, wherein said magnetic component comprises magnetic oxide. --

-- 496. (NEW) The oligo- or polydeoxyribonucleotide of claim 495, wherein said magnetic oxide comprises ferric oxide. --

-- 497. (NEW) The oligo- or polydeoxyribonucleotide of claim 492, wherein said enzyme or enzyme component is selected from the group consisting of alkaline phosphatase, acid phosphatase, β -galactosidase, ribonuclease, glucose oxidase and peroxidase. --

-- 498. (NEW) The oligo- or polydeoxyribonucleotide of claim 492, wherein said metal-containing component is catalytic. --

-- 499. (NEW) The oligo- or polydeoxyribonucleotide of claim 492, wherein said fluorescent component comprises a member selected from the group consisting of fluorescein, rhodamine and dansyl. --

-- 500. (NEW) The oligo- or polydeoxyribonucleotide of claim 492, wherein Sig is selected from the group consisting of an antigen or hapten capable of complexing with an antibody or antibody component specific thereto, and an antibody or antibody component capable of complexing with an antigen or hapten. --

-- 501. (NEW) The oligo- or polydeoxyribonucleotide of claim 482, wherein said oligo- or polydeoxyribonucleotide is terminally ligated or attached to a polypeptide. --

-- 502. (NEW) A composition comprising the oligo- or polydeoxyribonucleotide of claim 482, a polypeptide capable of forming a complex with Sig and a moiety which can be detected when such complex is formed. --

-- 503. (NEW) The composition of claim 500, wherein said polypeptide comprises polylysine. --

-- 504. (NEW) The composition of claim 502, wherein said polypeptide is selected from the group consisting of avidin, streptavidin and anti-Sig immunoglobulin. --

-- 505. (NEW) The composition of claim 502, wherein Sig is a ligand and said polypeptide is an antibody thereto. --

-- 506. (NEW) The oligo- or polydeoxyribonucleotide of claim 482, wherein said Sig moiety is attached to a terminal nucleotide in said oligo- or polydeoxyribonucleotide. --

507. ^{AMENDED} (Rewritten) The oligo- or polydeoxyribonucleotide of claim 506, wherein z of said terminal nucleotide comprises a hydrogen atom at the 2' position thereof.

508. ^{AMENDED} (Rewritten) The oligo- or polydeoxyribonucleotide of claim 506, wherein both y and z of said terminal nucleotide comprise a hydrogen atom at each of the 3' and 2' positions thereof, respectively.

-- 509. (NEW) The oligo- or polydeoxyribonucleotide of claim 482, comprising at least one ribonucleotide. --

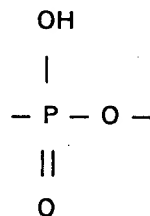
The diagram illustrates a branched polysaccharide structure. It features a main chain of repeating units enclosed in large square brackets with a subscript m . Each unit consists of a phosphate group ($\text{OH}-\text{P}(=\text{O})(\text{OH})_2$) linked via a dashed line to a ribose sugar. The ribose is in a chair conformation, with a substituent B' at the C5 position. A branch is formed by a phosphate group linked to a second ribose unit, which has a substituent $\text{B} \cdots \text{A}$ at its C5 position. This second ribose is further linked to a third ribose unit, which is enclosed in its own set of brackets with a subscript n . This third ribose has a substituent B'' at its C5 position and is linked to a terminal phosphate group ($\text{O}-\text{P}(=\text{O})(\text{OH})_2$). The ribose units are connected at their C1 positions by α -1,3-glycosidic bonds.

Enz-5(D6)(C2)

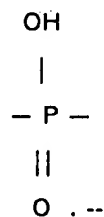
-- 512. (NEW) The oligo- or polyribonucleotide of claim 511, wherein said Sig is or renders the nucleotide self-signaling or self-indicating or self-detecting. --

-- 513. (NEW) The oligo- or polyribonucleotide of claim 511, wherein said Sig moiety comprises at least three carbon atoms. --

-- 514. (NEW) The oligo- or polyribonucleotide of claim 511, wherein said covalent attachment is selected from the group consisting of



and

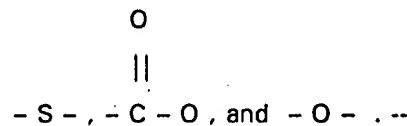
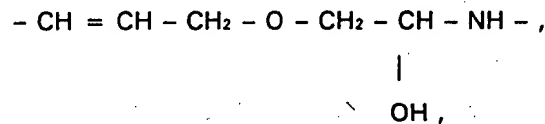
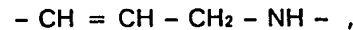


-- 515. (NEW) The oligo- or polyribonucleotide of claim 511, wherein said chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal. --

-- 516. (NEW) The oligo- or polyribonucleotide of claim 511, wherein said chemical linkage comprises a member selected from the group consisting of an olefinic bond at the alpha-position relative to the point of attachment to the nucleotide, a $-\text{CH}_2\text{NH}-$ moiety, or both. --

-- 517. (NEW) The oligo- or polyribonucleotide of claim 511, wherein said chemical linkage comprises an allylamine group. --

-- 518. (NEW) The oligo- or polyribonucleotide of claim 511, wherein said chemical linkage comprises or includes an olefinic bond at the delta-position relative to the point of attachment to the nucleotide, or any of the moieties:



-- 519. (NEW) The oligo- or polyribonucleotide of claim 511, wherein said chemical linkage of Sig includes a glycosidic linkage moiety. --

~~520. (Amended)~~ ^{AMENDED} The oligo- or polyribonucleotide of claim 511, wherein said PM is a monophosphate, a diphosphate or a triphosphate and said Sig moiety is covalently attached to said PM through a phosphorus atom or a phosphate oxygen.

-- 521. (NEW) The oligo- or polyribonucleotide of claim 511, wherein Sig comprises a component selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, an enzyme or an enzyme component, a hormone or a hormone component, a metal-containing component, a fluorescent component, a chemiluminescent component, an antigen, a hapten and an antibody or an antibody component, or a combination of any of the foregoing. --

-- 522. (NEW) The oligo- or polyribonucleotide of claim 521, wherein said electron dense component comprises ferritin. --

- 523. (NEW) The oligo- or polyribonucleotide of claim 511, wherein Sig is complexed with a binding protein therefor, and said binding protein is conjugated to ferritin. --
- 524. (NEW) The oligo- or polyribonucleotide of claim 521, wherein said magnetic component comprises a magnetic oxide. --
- 525. (NEW) The oligo- or polyribonucleotide of claim 524, wherein said magnetic oxide comprises ferric oxide. --
- 526. (NEW) The oligo- or polyribonucleotide of claim 521, wherein said enzyme or enzyme component is selected from the group consisting of alkaline phosphatase, acid phosphatase, β -galactosidase, ribonuclease, glucose oxidase and peroxidase. --
- 527. (NEW) The oligo- or polyribonucleotide of claim 521, wherein said metal-containing component is catalytic. --
- 528. (NEW) The oligo- or polyribonucleotide of claim 521, wherein said fluorescent component comprises a member selected from the group consisting of fluorescein, rhodamine and dansyl. --
- 529. (NEW) The oligo- or polyribonucleotide of claim 521, wherein Sig is selected from the group consisting of an antigen or hapten capable of complexing with an antibody or antibody component specific thereto, and an antibody or antibody component capable of complexing with an antigen or hapten. --
- 530. (NEW) The oligo- or polyribonucleotide of claim 511, wherein said oligo- or polyribonucleotide is terminally ligated or attached to a polypeptide. --
- 531. (NEW) A composition comprising the oligo- or polyribonucleotide of claim 511, a polypeptide capable of forming a complex with Sig and a moiety which can be detected when such complex is formed. --
- 532. (NEW) The composition of claim 531, wherein said polypeptide comprises polylysine. --

-- 533. (NEW) The composition of claim 531, wherein said polypeptide is selected from the group consisting of avidin, streptavidin and anti-Sig immunoglobulin. --

-- 534. (NEW) The composition of claim 531, wherein Sig is a ligand and said polypeptide is an antibody thereto. --

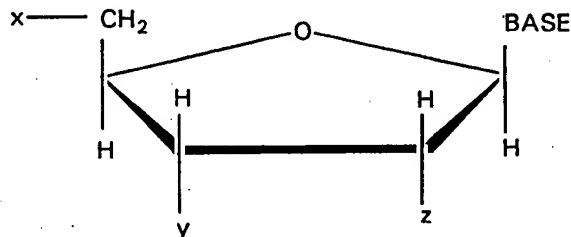
-- 535. (NEW) The oligo- or polyribonucleotide of claim 511, wherein said Sig moiety is attached to a terminal ribonucleotide in said oligo- or polyribonucleotide. --

-- 536. (NEW) The oligo- or polyribonucleotide of claim 535, wherein the sugar moiety of said terminal ribonucleotide has a hydrogen atom at the 2' position thereof. --

-- 537. (NEW) The oligo- or polyribonucleotide of claim 535, wherein the sugar moiety of said terminal nucleotide has a hydrogen atom at each of the 2' and 3' positions thereof. --

-- 538. (NEW) The oligo- or polyribonucleotide of claim 511, comprising at least one deoxyribonucleotide. --

-- 539. (NEW) An oligo- or polyribonucleotide comprising at least one nucleotide having the structural formula:



wherein BASE is a moiety selected from the group consisting of a pyrimidine, a purine and a deazapurine, or analog thereof, and wherein BASE is attached to the 1' position of the pentose ring from the N1 position when BASE is a pyrimidine or from the N9 position when BASE is a purine or a deazapurine;

wherein x is selected from the group consisting of H-, HO-, a mono-phosphate, a di-phosphate and a tri-phosphate;

wherein y is selected from the group consisting of HO-, a mono-phosphate, a di-phosphate and a tri-phosphate;

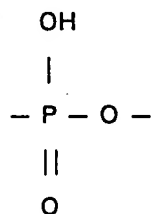
wherein z is HO-; and

wherein Sig is covalently attached to x, y or z directly or through a chemical linkage, said Sig being a moiety capable of non-radioactive detection when so attached to x, y or z, provided that when Sig is attached through a chemical linkage to y of a terminal ribonucleotide, said chemical linkage is not a cleaved 3' terminal ribonucleotide previously attached to said oligo- or polyribonucleotide. --

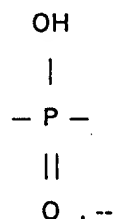
-- 540. (NEW) The oligo- or polyribonucleotide of claim 539, wherein said Sig is or renders the nucleotide or the oligo- or polynucleotide self-signaling or self-indicating or self-detecting. --

-- 541. (NEW) The oligo- or polyribonucleotide of claim 539, wherein said Sig moiety comprises at least three carbon atoms. --

-- 542. (NEW) The oligo- or polyribonucleotide of claim 539, wherein said covalent attachment is selected from the group consisting of



and

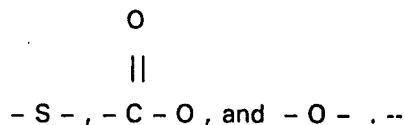
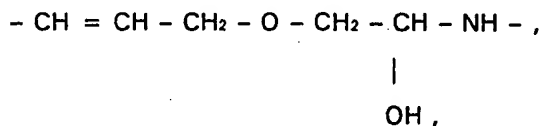
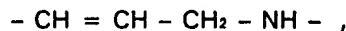


-- 543. (NEW) The oligo- or polyribonucleotide of claim 539, wherein said chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal. --

-- 544. (NEW) The oligo- or polyribonucleotide of claim 539, wherein said chemical linkage comprises a member selected from the group consisting of an olefinic bond at the alpha-position relative to the point of attachment to the nucleotide, a $-\text{CH}_2\text{NH}-$ moiety, or both. --

-- 545. (NEW) The oligo- or polyribonucleotide of claim 539, wherein said chemical linkage comprises an allylamine group. --

-- 546. (NEW) The oligo- or polyribonucleotide of claim 539, wherein said chemical linkage comprises or includes an olefinic bond at the delta-position relative to x, y or z, or any of the moieties:



-- 547. (NEW) The oligo- or polyribonucleotide of claim 539, wherein said chemical linkage of Sig includes a glycosidic linkage moiety. --

~~548. (Revoked)~~ ^{AMENDED} The oligo- or polyribonucleotide of claim 539, wherein said x and y each comprise a member selected from the group consisting of a monophosphate, a diphosphate and a triphosphate and said Sig moiety is covalently attached to either or both of said x and y through a phosphorus atom or a phosphate oxygen.

-- 549. (NEW) The oligo- or polyribonucleotide of claim 539, wherein Sig comprises a component selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, an enzyme or an enzyme component, a hormone or a hormone component, a metal-containing component, a fluorescent component, a chemiluminescent component, an antigen, a hapten and an antibody or an antibody component, or a combination of any of the foregoing. --

-- 550. (NEW) The oligo- or polyribonucleotide of claim 549, wherein said electron dense component comprises ferritin. --

- 551. (NEW) The oligo- or polyribonucleotide of claim 539, wherein Sig is complexed with a binding protein therefor, and said binding protein is conjugated to ferritin. --
- 552. (NEW) The oligo- or polyribonucleotide of claim 549, wherein said magnetic component comprises magnetic oxide. --
- 553. (NEW) The oligo- or polyribonucleotide of claim 552, wherein said magnetic oxide comprises ferric oxide. --
- 554. (NEW) The oligo- or polyribonucleotide of claim 549, wherein said enzyme or enzyme component is selected from the group consisting of alkaline phosphatase, acid phosphatase, β -galactosidase, ribonuclease, glucose oxidase and peroxidase. --
- 555. (NEW) The oligo- or polyribonucleotide of claim 549, wherein said metal-containing component is catalytic. --
- 556. (NEW) The oligo- or polyribonucleotide of claim 549, wherein said fluorescent component comprises a member selected from the group consisting of fluorescein, rhodamine and dansyl. --
- 557. (NEW) The oligo- or polyribonucleotide of claim 549, wherein Sig is selected from the group consisting of an antigen or hapten capable of complexing with an antibody or antibody component specific thereto, and an antibody or antibody component capable of complexing with an antigen or hapten. --
- 558. (NEW) The oligo- or polyribonucleotide of claim 539, wherein said oligo- or polyribonucleotide is terminally ligated or attached to a polypeptide. --
- 559. (NEW) A composition comprising the oligo- or polyribonucleotide of claim 539, a polypeptide capable of forming a complex with Sig and a moiety which can be detected when such complex is formed. --
- 560. (NEW) The composition of claim 559, wherein said polypeptide comprises polylysine. --

-- 561. (NEW) The composition of claim 559, wherein said polypeptide is selected from the group consisting of avidin, streptavidin and anti-Sig immunoglobulin. --

-- 562. (NEW) The composition of claim 559, wherein Sig is a ligand and said polypeptide is an antibody thereto. --

-- 563. (NEW) The oligo- or polyribonucleotide of claim 539, wherein said Sig moiety is attached to a terminal nucleotide in said oligo- or polyribonucleotide. --

AMENDED

564. (~~Re-written~~) The oligo- or polyribonucleotide of claim 563, wherein z of said terminal nucleotide comprises a hydrogen atom at the 2' position thereof.

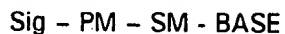
AMENDED

565. (~~Re-written~~) The oligo- or polyribonucleotide of claim 563, wherein both y and z of said terminal nucleotide comprise a hydrogen atom at each of the 3' and 2' positions thereof, respectively.

-- 566. (NEW) The oligo- or polyribonucleotide of claim 539, comprising at least one deoxyribonucleotide. --

The diagram illustrates a branched polysaccharide structure. It features a main chain of repeating units enclosed in large square brackets, with a subscript 'm' indicating the number of units. Each unit consists of a pyranose ring (six-membered ring) linked via its C1 position to a phosphate group (P=O, OH, OH). The phosphate group is further linked to a CH₂ group, which is connected to the C6 position of the next pyranose ring in the chain. A side chain branches off from the main chain at a specific pyranose unit. This side chain also consists of a pyranose ring linked to a phosphate group, which is then linked to a CH₂ group, and finally to a pyranose ring. The side chain terminates with a label 'B...A'. The main chain also terminates with a label 'B'' at the C5 position of the final pyranose unit. The pyranose rings are shown in a chair conformation, with hydrogen atoms (H) and substituents (Z, B', A) explicitly labeled. The phosphate groups are shown with their respective oxygen atoms and hydroxyl groups.

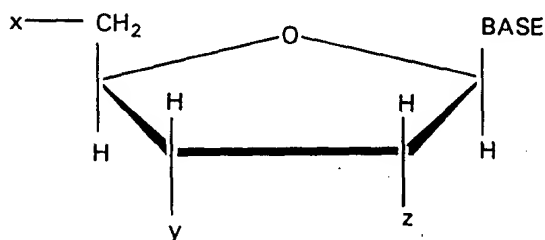
-- 568. (NEW) A composition comprising a polymeric compound having attached directly or indirectly thereto at least one deoxyribonucleotide having the formula:



Enz-5(D6)(C2)

-- 569. (NEW) The composition of claim 568, wherein said polymeric compound is selected from the group consisting of an oligo- or polynucleotide, an oligo- or polypeptide, and an oligo- or polysaccharide. --

-- 570. (NEW) A composition comprising a polymeric compound attached directly or indirectly to at least one deoxyribonucleotide having the structural formula:



wherein BASE is selected from the group consisting of a pyrimidine, a purine and a deazapurine, or analog thereof, and wherein BASE is attached to the 1' position of the pentose ring from the N1 position when BASE is a pyrimidine or from the N9 position when BASE is a purine or a deazapurine;

wherein x comprises a member selected from the group consisting of: H- , HO- , a mono-phosphate, a di-phosphate and a tri-phosphate;

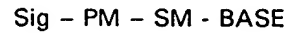
wherein y comprises a member selected from the group consisting of: H- , HO- , a mono-phosphate, a di-phosphate and a tri-phosphate;

wherein z comprises H- ; and

wherein Sig is covalently attached to x, y or z directly or through a chemical linkage, said Sig being a moiety capable of non-radioactive detection when so attached to x, y or z. --

-- 571. (NEW) The composition of claim 570, wherein said polymeric compound is selected from the group consisting of an oligo- or polynucleotide, an oligo- or polypeptide, and an oligo- or polysaccharide. --

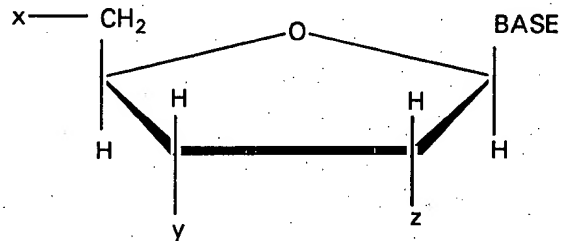
-- 572. (NEW) A composition comprising a polymeric compound having attached directly or indirectly thereto at least one ribonucleotide having the formula:



wherein PM is a phosphate moiety, SM is a sugar moiety and BASE is a moiety selected from the group consisting of a pyrimidine, a purine and a deazapurine, or analog thereof, said PM being attached to SM at a position of SM selected from 2', 3' and 5', or combinations thereof, said BASE being attached to SM, and Sig being covalently attached to PM directly or via a chemical linkage, said Sig being a moiety capable of non-radioactive detection when attached to PM or when said ribonucleotide is incorporated into said composition, provided that when Sig is attached through a chemical linkage to a terminal PM at the 3' position of a terminal ribonucleotide, said chemical linkage is not a cleaved 3' terminal ribonucleotide previously attached to said composition. --

-- 573. (NEW) The composition of claim 572, wherein said polymeric compound is selected from the group consisting of an oligo- or polynucleotide, an oligo- or polypeptide, and an oligo- or polysaccharide. --

-- 574. (NEW) A composition comprising a polymeric compound having attached directly or indirectly thereto at least one nucleotide having the structural formula:



wherein BASE is a moiety selected from the group consisting of a pyrimidine, a purine and a deazapurine, or analog thereof, and wherein BASE is attached to the 1' position of the pentose ring from the N1 position when BASE is a pyrimidine or from the N9 position when BASE is a purine or a deazapurine;

wherein x is selected from the group consisting of H-, HO-, a mono-phosphate, a di-phosphate and a tri-phosphate;

wherein y is selected from the group consisting of HO-, a mono-phosphate, a di-phosphate and a tri-phosphate;

wherein z is HO-; and

wherein Sig is covalently attached to x, y or z directly or through a chemical linkage, said Sig being a moiety capable of non-radioactive detection when so attached to x, y or z, provided that when Sig is attached through a chemical linkage to y of a terminal ribonucleotide, said chemical linkage is not a cleaved 3' terminal ribonucleotide previously attached to said composition. --

-- 575. (NEW) The composition of claim 572, wherein said polymeric compound is selected from the group consisting of an oligo- or polynucleotide, an oligo- or polypeptide, and an oligo- or polysaccharide. --

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